

APPENDIX C: DIFFERENCES BETWEEN PROPOSED AND FINAL RULE

Section	Final Rule	Proposed Rule	Explanation of Changes
WAC 296-62-051	Appendices WAC	Appendices WAC 296-62-05170 Appendices	An unnecessary reference for appendices in the table of contents was removed.
WAC 296-62-05101 What is the purpose of this rule?	The purpose of this rule is to reduce employee exposure to specific workplace hazards that can cause or aggravate work-related musculoskeletal disorders (WMSDs).	The purpose of this rule is to reduce employee exposure to workplace hazards that can cause or aggravate work-related musculoskeletal disorders (WMSDs).	The word “specific” was added for clarity.
	(removed)	The department will work with a group of Demonstration Employers to test and improve guidelines, best practices, and inspection policies and procedures as they are developed.	Language removed from this section because it was redundant. Same information is covered in Part 3, under "Help for employers in implementing the rule".
WAC 296-62-05103 Which employers are covered by this rule?	A “caution zone job” is a job where an employee’s typical work activities include any of the specific physical risk factors listed in WAC 296-62-05105.	A “caution zone job” is a job or task where an employee’s typical work includes any of the physical risk factors listed in WAC 296-62-05105.	Language was modified to clarify intent or meaning without changing requirements in the proposal. This was necessary because comments indicated that the proposed language was unclear or could be too easily misunderstood.
WAC 296-62-05105 What is a “caution zone job?”	“Caution zone” A "caution zone job" is a job where an employee's typical work activities include any of the specific physical risk factors listed below. Typical work activities are those that are a regular and foreseeable part of the job	“Caution zone” A "caution zone job" is a job or task where an employee's typical work includes any of the physical risk factors listed below.	In response to comments, "typical" work activities are defined in the new language to make it clear that incidental or occasional exposures are not covered under the rule.

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WAC 296-62-05105 What is a “caution zone job?” (continued)	and occur more than one day per week, and more frequently than one week per year. <ul style="list-style-type: none"> Duration (for example, 2 hours) refers to the total amount of time per day employees are exposed to the risk factor, not how long they spend performing the work activity that includes the risk factor. 		Language was added to clarify intent or meaning without changing requirements in the proposal. This was necessary because comments indicated that the proposed language was unclear or could be too easily misunderstood.
	Awkward Posture (1) Working with the neck or back bent more than 30 degrees (without support and without the ability to vary posture) more than 2 hours total per day.	Awkward Postures Working with the neck, back or wrist(s) bent more than 30 degrees for more than 2 hours total per workday	Wrist(s) was removed here because comments noted that a bent wrist alone (without added force or repetition) would not be appropriate to address. Language was added to clarify this risk factor is only applicable to work activities without support and without the ability to vary posture. Comments noted the need to clarify that the rule should not address situations where employees voluntarily assumed awkward postures and could easily change them.
	(3) Squatting more than 2 hours total per day . (4) Kneeling more than 2 hours total per day.	Squatting for a total of 2 hours per workday or kneeling for a total of 2 hours per workday	Editorial changes only.

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WAC 296-62-05105 What is a “caution zone job?” (continued)	<p>High Hand Force</p> <p>(5) Pinching an unsupported object(s) weighing 2 or more pounds per hand, or pinching with a force of 4 or more pounds per hand, more than 2 hours total per day (comparable to pinching half a ream of paper).</p> <p>(6) Gripping an unsupported object(s) weighing 10 or more pounds per hand or gripping with a force of 10 or more pounds per hand for more than 2 hours total per day (comparable to clamping light duty automotive jumper cables onto a battery)</p>	<p>High Hand Force</p> <ul style="list-style-type: none"> Pinching an object weighing more than 2 pounds per hand for more than 2 hours total per workday Gripping an object weighing more than 6 pounds per hand for more than 2 hours total per workday 	<p>The determination of pinch force when using the weight of an object was clarified to be the weight of an “unsupported” object. Direct pinch force measurement or estimate (4 or more pounds per hand) was also added as an element of this subsection, with an example for estimating what 4 or more pounds per hand would be comparable to.</p> <p>The determination of grip force when using the weight of an object was clarified to be the weight of an “unsupported” object. Direct grip force measurement or estimate (10 or more pounds per hand) was also added as an element of this subsection, with an example for estimating what 10 or more pounds per hand would be comparable to.</p> <p>While there is some evidence for 6 lbs. of grip force as a risk factor, the evidence is stronger at higher force levels of 9 to 10 lbs., so this risk factor was changed to gripping 10 lbs. or more.</p> <p>The actual risk factor in high hand force is the pinch or grip force itself, for which object weight is merely one surrogate measure. Testimony during the public hearings addressed this</p>

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WAC 296-62-05105 What is a “caution zone job?” (continued)			deficiency. While the weight of objects handled is the simplest method for estimating hand force, the department added language on how to estimate pinch or grip forces in other simple ways.
	Repeated Impact (9) Using the hand (heel/base of palm) or knee as a hammer more than 10 times per hour more than 2 hours total per day.	Repeated Impact <ul style="list-style-type: none"> Using the hand or knee as a hammer more than 10 times per hour for more than 2 hours total per workday 	Language added to clarify the portion of the hand that this risk factor addresses.
	Moderate to High Hand-Arm Vibration	Moderate to High Vibration	Language added to clearly specify that this risk factor applies only to hand-arm vibration.
WAC 296-62-05120 Which employees must receive ergonomics awareness education and when?	Ergonomics awareness education materials provided by the Department of Labor & Industries may be used to meet these requirements.		Language added to clarify that department-provided materials can be used to meet the basic awareness education requirements of the rule.
WAC 296-62-05122 What must be included in ergonomics awareness education?	Ergonomics awareness education (for example: oral presentations, videos, computer-based presentations, or written materials with discussion) must include: <ul style="list-style-type: none"> Information on work-related causes of musculoskeletal disorders, including all caution zone risk factors listed in 296-62- 	Ergonomics awareness education must include: <ol style="list-style-type: none"> Information on work-related causes of musculoskeletal disorders, including physical risk factors present in the type of job to which the employee is assigned (nonwork factors may be included as well); 	Language added to provide examples of a number of different ways that awareness education could be provided. Language changed to focus the awareness education information about risk factors on all of the factors covered by the rule. This allows the

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WAC 296-62-05122 What must be included in ergonomics awareness education? (continued)	05105 (non-work factors may be included as well);		awareness education to be truly "portable" and avoids the need for re-education in the event an employee moves to a new job (or has a change in their existing job) with a different caution zone job risk factor(s). Comments noted the difficulty employers would have if the awareness education was not portable between different types of jobs.
WAC 296-62-05130 What options do employers have for analyzing and reducing WMSD hazards?	All covered employers must determine whether "caution zone jobs" have WMSD hazards and must reduce the WMSD hazards identified as described below.	All covered employers must determine whether "caution zone jobs" have WMSD hazards and must reduce the WMSD hazards identified.	Editorial changes for clarity and simplicity.
WAC 296-62-05130 – Analyzing and reducing WMSD hazards: General Performance Approach	(1) The employer must use hazard control levels as effective as the recommended levels in widely used methods, such as, the Job Strain Index, the lifting guidelines in the Department of Energy ErgoEASER, the ANSI S3.34-1986 (R1997) Hand Arm Vibration Standards, the 1991 NIOSH Lifting Equation (as described in Waters 1993), the UAW-GM Risk Factor Checklists, applicable ACGIH threshold limit values for physical agents, Rapid Entire Body Assessment (REBA), or Rapid Upper Limb Assessment	1. The employer must choose criteria for this analysis that are as effective as widely accepted nationally recognized criteria, such as the Liberty Mutual Manual Handling Tables, the Job Strain Index, the Department of Energy ErgoEASER, the ANSI S3.34-1986 (R1997) Hand Arm Vibration Standards, the 1991 NIOSH Lifting Equation, or the UAW-GM Risk Factor Checklists.	Comments requested that the term "as effective as" be clarified. This language makes it clear that measurement of effectiveness is hazard-based and if a general performance method is chosen it must include recommended hazard control levels as effective as those found in the examples given. Language added to clarify the Department of Energy ErgoEASER example includes only their lifting guidelines. Comments noted that there is no

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WAC 296-62-05130 – Analyzing and reducing WMSD hazards: General Performance Approach (continued)	(RULA).		<p>system of national recognition for ergonomics programs. "Widely used" is clearer and more reasonable.</p> <p>Liberty Mutual Manual Handling Tables were taken out of the method examples because the tables do not include a recommended hazard control level.</p> <p>Three new widely used method examples were added.</p>
	(2) Physical demands specific to the worksite including posture, force, repetition, repeated impacts, hand-arm vibration, duration, work pace, task variability, and recovery time.	a. Physical demands specific to the worksite including posture, force, repetition, repeated impacts, vibration, duration, work pace, task variability, and recovery cycles;	<p>Language added to clearly specify that this risk factor applies only to hand-arm vibration.</p> <p>“Recovery cycle” was replaced by “recovery time” for better understanding.</p>
	<p>(5) Employers must reduce WMSD hazards as described below by:</p> <p>a. Implementing controls that do not rely primarily on employee behavior to reduce WMSD hazards, such as the following:</p> <p>b. If employers cannot reduce WMSD hazards below the hazard level using the controls identified above, they must supplement those</p>	<p>5. Measures used by employers to reduce WMSD hazards must take into account the causes of the hazards and must be implemented in the following order of preference:</p> <p>a. Engineering or administrative measures to reduce WMSD hazards. Examples include</p> <ul style="list-style-type: none"> • work schedule modification <p>b. Measures that primarily rely on individual work practices or personal protective</p>	<p>Comments noted that the language on order of preference for controls was not clear. Language was modified to clarify the meaning. This language makes it clear that if the first preference controls have not reduced the WMSD hazards below the hazard level, then (feasible) interim measures are to be used to supplement the controls and further reduce exposures.</p>

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<p>WAC 296-62-05130 – Analyzing and reducing WMSD hazards: General Performance Approach (continued)</p>	<p>controls with interim measures that primarily rely on individual work practices or personal protective equipment. Examples of such practices include the following:</p> <p>c. This rule does not require an employer to control WMSD hazards by replacing full-time employees with part-time employees or otherwise reducing an individual's hours of employment. If an employer has implemented all other technologically and economically feasible controls, and a WMSD hazard remains, the employer will be deemed in compliance with this subsection.</p>	<p>equipment to reduce WMSD hazards. Examples include</p> <ul style="list-style-type: none"> • kneepads 	<p>Two examples of controls (work schedule modification and kneepads) were eliminated to simplify the lists and provide the clearest examples.</p> <p>Many comments noted a concern that feasible controls could include reducing full-time workers or hiring only part-time workers to reduce hazardous exposures. Language was added to clarify the intent in regards to this issue.</p>
<p>WAC 296-62-05150 How are terms and phrases used in this rule?</p>	<p>ACGIH threshold limit values for physical hazards – the American Conference of Governmental Industrial Hygienists, Thresholds Limit Values for Chemical Substances and Physical Agents in the Work Environment, and Biological Exposure Indices (TLVs and BEIs). Available for purchase at the ACGIH web site: http://www.acgih.org</p>		<p>Reference added for new method example included in WAC 296-62-05130(1) (General Performance Approach).</p>

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WAC 296-62-05150 How are terms and phrases used in this rule? (continued)	“Caution zone jobs” – Jobs where an employee’s typical work activities include any of the specific physical risk factors identified in WAC 296-62-05105.	“Caution zone jobs” – Jobs or tasks in which the employee’s typical work includes physical risk factors identified in WAC 296-62-05105.	Editorial changes for clarity.
	Full Time Equivalent (FTE) – The equivalent of one person working full-time for one year (2,000 worker hours per year). For example, two persons working half-time count as one FTE.		Definition added to clarify meaning of FTE as used in the implementation timeline.
	High Hand-Arm Vibration Levels – Tools with vibration values equal to or greater than 10 meters per second squared (m/s^2) eight hour equivalent. Examples include some impact wrenches, carpet strippers, chain saws, and percussive tools.		Definition added for clarity. Comments noted need for additional definition.
	(removed)	Liberty Mutual Manual Handling Tables – The design of manual handling tasks: Revised tables of maximum acceptable weights and forces, Snook, S., Ciriello, V., (1991). Published in Ergonomics, Vol. 34, No. 9, pgs. 1197-1213.	Reference for this method example in WAC 296-62-05130(1) (General Performance Approach) was removed because the Tables do not include a recommended hazard control level.
	Moderate Hand-Arm Vibration Levels – Tools with vibration values between 2.5 and 10 meters per second squared (m/s^2) eight-hour equivalent. Examples include some grinders, sanders, and jig saws.		Definition added for clarity. Comments noted need for additional definition.

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WAC 296-62-05150 How are terms and phrases used in this rule? (continued)	NIOSH Lifting Equation, 1991 Waters, T.R., Putz-Anderson, V., Garg, A. and Fine, L.J. (1993). Revised NIOSH equation for the design and evaluation of manual lifting tasks. Published in Ergonomics, volume 36(7), pages 749-776. For a manual on using the lifting equation see: Applications Manual for Revised Lifting Equation, Waters, T., Putz-Anderson, V., Garg, A. (1994). Available from the National Technical Information Center (NTIS), Springfield, VA 22161. 1-800-553-6847. Calculator web site: http://www.industrialhygiene.com/calculift.html Application guideline web site: http://www.cdc.gov/niosh/94-110.html	NIOSH Lifting Equation, 1991 – Applications Manual for Revised Lifting Equation, Waters, T., Putz-Anderson, V., Garg, A. (1994). Available from the National Technical Information Center (NTIS), Springfield, VA 22161. 1-800-553-6847. Calculator website: http://www.industrialhygiene.com/calculift.html Application guideline website: http://www.cdc.gov/niosh/94-110.html	Additional reference added for clarity.
	<u>Rapid Entire Body Assessment tool (REBA)</u> - Hignett, S. and McAtamney, L. (2000) Rapid entire body assessment (REBA). Published in Applied Ergonomics, volume 31, pages 201-205.		Reference added for new method example included in WAC 296-62-05130(1) (General Performance Approach).
	The Rapid Upper Limb Assessment (RULA) McAtamney, L. and Corlett, E.N. (1993) RULA: A survey method for the investigation of work-related upper limb disorders. Published in		Reference added for new method example included in WAC 296-62-05130(1) (General Performance Approach).

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WAC 296-62-05150 How are terms and phrases used in this rule? (continued)	Applied Ergonomics, volume 24 (2), pages 91-99.		
	Work Activities – The physical demands, exertions, or functions of the job or task.		Definition added for clarity. Comments noted need for additional definition.

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WAC 296-62-05160 When must employers comply with this rule?

INITIAL IMPLEMENTATION SCHEDULE		
FINAL RULE		
Employer	Awareness Education Completed And Hazard Analysis Completed	Hazard Reduction Completed
<ul style="list-style-type: none"> All employers in SIC codes* 078, 152, 174, 175,176, 177, 242, 421, 451, 541, 805, and 836 who employ 50 or more annual full time equivalents (FTEs) in Washington state. The Washington Dept. of Labor & Industries 	July 1, 2002	July 1, 2003
<ul style="list-style-type: none"> The remaining employers in SIC codes* 078, 152, 174, 175,176, 177, 242, 421, 451, 541, 805, and 836. All other employers who employ 50 or more annual full time equivalents (FTEs) in Washington state. 	July 1, 2003	July 1, 2004
All other employers employing 11-49 annual full time equivalents (FTEs) in Washington state.	July 1, 2004	July 1, 2005
All other employers employing 10 or fewer annual full time equivalents (FTEs) in Washington state.	July 1, 2005	July 1, 2006

PROPOSED RULE				
Employer	Effective Date	Awareness Education Completed	Hazard Analysis Completed	Hazard Reduction Completed
<ul style="list-style-type: none"> All employers in SIC codes** 152, 174, 175,176, 177, 242, 411, 421, 451, 541,734 and 805 that employ 50 or more employees in workplaces described by these SIC codes The WA Dept. of Labor & Industries 	One year after the rule adoption date *00/00/00	Adoption date + 15 months	Adoption date + 24 months	Adoption date + 36 months
<ul style="list-style-type: none"> Employers in SIC codes** 152, 174, 175,176, 177, 242, 411, 421, 451, 541,734, and 805 that employ less than 50 employees in workplaces described by these SIC codes. All other employers that employ 50 or more employees 	Two years after the rule adoption date	Adoption date + 27 months	Adoption date + 33 months	Adoption date + 48 months
All other employers employing 11-49 employees	Three years after the rule adoption date	Adoption date + 39 months	Adoption date + 45 months	Adoption date + 60 months
All other employers	Four years after the rule adoption date	Adoption date + 51 months	Adoption date + 57 months	Adoption date + 72 months

WAC 296-62-05160 When must employers comply with this rule?

EXPLANATION OF CHANGES	
Two industries in the list of high-risk SIC codes were dropped (411, 734) and two new ones added (078, 836) to reflect the most current data available on the highest risk industries for combined State Fund and Self-Insured compensable non-traumatic soft tissue disorders (1992-1998).	
<p>Comments noted that small employers who may hire a large number of employees for short periods of time would be treated as if they had the resources of large employers if the implementation timeline were based on overall number of employees. Language was modified to base the implementation timeline on annual full time equivalents (FTEs) to address this concern. Language was also modified to base the implementation timeline on annual FTEs per employer rather than per individual workplace. This change was made to simplify and clarify implementation based on SIC codes. Identification of SIC codes to the individual worksite level is more complex and could be difficult for employers to identify and apply.</p> <p>The implementation timelines were extended to allow employers more time to understand the rule requirements, plan, and obtain assistance if necessary before compliance begins. Comments noted the need for more time for implementation. The dates for ergonomic awareness education to be completed were moved back to the dates for hazard analysis to be completed. In addition, the time frame for hazard analysis to be completed was moved back 3 months for the 2nd, 3rd, and 4th groups of employers in the implementation schedule. These changes provide an additional 9 months for each of the 4 groups in the implementation schedule before any requirements would be enforced.</p>	
The "effective date" column of the implementation schedule was removed as it was not necessary. Dates were added to the implementation schedule to clarify when the requirements would be enforced.	

SUPPLEMENTAL IMPLEMENTATION SCHEDULE		
FINAL RULE		
Employer	Awareness Education Completed And Hazard Analysis Completed	Hazard Reduction Completed
New workplaces or businesses	One year from the date the new workplace or business is established OR According to the schedule above	15 months from the date the new workplace or business is established OR According to the schedule above
Significant changes to existing workplaces or businesses	2 months after significant changes occur OR According to the schedule above	3 months after significant changes occur OR According to the schedule above

** Note: SIC code is the employer's primary SIC based on hours of employment. See Appendix C of this rule for descriptions of these SIC codes.*

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WAC 296-62-05160 When must employers comply with this rule?

PROPOSED RULE				
Employer	Effective Date	Awareness Education Completed	Hazard Analysis Completed	Hazard Reduction Completed
New workplaces or businesses	One year from the date the new workplace or business was established OR The initial implementation date that applies, whichever is later	+ 1 month OR According to the schedule above	+ 2 months OR According to the schedule above	+ 3 months OR According to the schedule above
Significant changes to existing workplaces or businesses	When they occur OR The initial implementation date that applies, whichever is later	+ 1 month OR According to the schedule above	+2 months OR According to the schedule above	+ 3 months OR According to the schedule above

**Note: Actual dates will be inserted for final rule.*





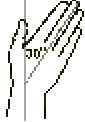
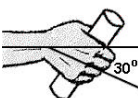





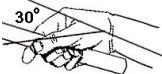
*** Note: See Appendix C of this rule for descriptions of these SIC codes.*

EXPLANATION OF CHANGES
<p>The "effective date" column was removed as it was not necessary. Dates were added to the implementation schedule to clarify when the requirements would be enforced.</p> <p>The timelines for ergonomic awareness education to be completed were changed to the same timeline for hazard analysis to be completed.</p> <p>For new workplaces that are established after the initial implementation schedule has passed, the combined awareness education and hazard analysis timeline was shortened by two months. This change was made because these employers will have the benefit of existing education, analysis tools, and control options utilized by their industry to assist them to come into compliance within a year.</p>

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Note: Help for employers in implementing the rule	3. Establishing Inspection Policies and Procedures The department will develop policies and procedures for inspections and enforcement of this rule before the rule is enforced.	3. Establishing Inspection Policies and Procedures The department will develop policies and procedures for inspections and enforcement of this rule prior to the first effective date.	Language modified to reflect the fact that the "effective date" language was removed from the implementation schedule.
	4. Conducting Demonstration Projects Following adoption of this rule, the department will work with employers and employees to undertake demonstration projects to test and improve guidelines, "best practices" and inspection policies and procedures as they are developed.	4. Testing Guidelines with Demonstration Employers Following adoption of this rule, the department intends to identify employers who agree to serve as Demonstration Employers. The department will work with these employers to test and improve guidelines, best practices and inspection policies and procedures as they are developed.	Language was modified to "demonstration projects" to clarify the department's intent to work on demonstration activities with both employers and employees.

WAC 296-62-05172 Appendix A: Illustrations of physical risk factors

FINAL RULE	PROPOSED RULE	EXPLANATION OF CHANGES
<p>Awkward Postures</p> <p>Bending the wrist Extension:</p>   <p>Flexion:</p>   <p>Ulnar deviation (bent towards the little finger):</p>  	<p>Awkward Postures</p> <p>Bending the wrist</p>      	<p>Drawings in this Appendix were updated to illustrate changes made to risk factors in the caution zone (WAC 296-62-05105) or in Appendix B.</p> <p>Illustrations were labeled for clarity.</p> <p>Different illustrations were added to clarify ulnar deviation.</p>
<p>High Hand Force</p> <p>Gripping 10 lbs.</p>	<p>High Hand Force</p> <p>Grasping 6 lbs.</p>	<p>"Grasping" was changed to "gripping" to be consistent with the language used in the rule.</p> <p>While there is some evidence for 6 lbs. of grip force as a risk factor, the evidence is stronger at higher force levels of 9 to 10 lbs., so this risk factor was changed to gripping 10 lbs. or more.</p>

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WAC 296-62-05174 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.



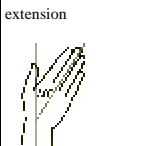
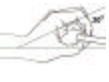

FINAL RULE		PROPOSED RULE	EXPLANATION OF CHANGES
For each "caution zone job" find any physical risk factors that apply. Reading across the page, determine if all of the conditions are present in the work activities. If they are, a WMSD hazard exists and must be reduced below the hazard level or to the degree technologically and economically feasible (see WAC 296-62-05130(4), specific performance approach).		For each "caution zone job" find any physical risk factors that apply. Reading across the page, determine if all of the conditions are present in the job. If they are, a WMSD hazard exists and must be reduced (see WAC 296-62-05130(4), specific performance approach).	Language modified here to be consistent with language used elsewhere in the rule (i.e. "work activities," and "below the hazard level or to the degree technologically and economically feasible").

FINAL RULE		PROPOSED RULE	EXPLANATION OF CHANGES
Awkward Postures		Awkward Posture	
Body Part	Physical Risk Factor	Physical Risk Factor	
Neck	Working with the neck bent more than 45° (without support or the ability to vary posture)	Bending the neck, without added support, 45° or more	Language added to include "without the ability to vary posture." Comments noted that language was needed to clarify that the rule should not address situations where employees voluntarily assumed awkward postures and could easily change them. Language also added for clarity.
Back	Working with the back bent forward more than 30° (without support, or the ability to vary posture).	Bending the back forward to work, without added support, more than 30°	Language added to include "without the ability to vary posture." Comments noted that language was needed to clarify that the rule should not address situations where employees voluntarily assumed awkward postures and could easily change them. Language also added for clarity.
	Working with the back bent forward more than 45° (without support or the ability to vary posture).	Bending the back forward to work, without added support, more than 45°	Language added to include "without the ability to vary posture." Comments noted that language was needed to clarify that the rule should not address situations where employees voluntarily assumed awkward postures and could easily change them. Language also added for clarity.

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



WAC 296-62-05174 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.

FINAL RULE				PROPOSED RULE			EXPLANATION OF CHANGES
Awkward Posture				Awkward Postures			The distinction between kneeling on hard or soft surfaces was removed because evidence was not strong. Duration was kept at the higher level (4 hrs) because the scientific evidence was stronger at this exposure level.
Body Part	Physical Risk Factor	Duration	Visual Aid	Physical Risk Factor	Duration	Visual Aid	
	Kneeling	More than 4 hours total per day		Kneeling on hard surfaces	More than 2 hours total per workday		
				Kneel on soft or padded surfaces	More than 4 hours total per workday		

FINAL RULE					PROPOSED RULE				EXPLANATION OF CHANGES
High Hand Force					High Hand Force				The determination of pinch force when using the weight of an object was clarified to be the weight of an “unsupported” object.
Body Part	Physical Risk Factor	Combined with	Duration	Visual Aid	Physical Risk Factor	Combined with	Duration	Visual Aid	
Arms, wrists, hands	Pinching an unsupported object(s) weighing 2 or more pounds per hand or pinching with a force of 4 or more pounds per hand. (comparable to pinching half a ream of paper)	Highly repetitive motion	More than 3 hours total per day		Pinching an object(s) weighing more than 2 lbs. per hand	Highly repetitive motions	More than 3 hours total per workday		Direct pinch force measurement or estimate (4 or more pounds per hand) was also added as an element of this subsection, with an example for estimating what 4 or more pounds per hand would be comparable to. Public comments noted that the proposed language was deficient in addressing actual pinch forces.
		Wrists bent in flexion 30° or more or in extension 45° or more or in ulnar deviation 30° or more.	More than 3 hours total per day	  		Wrists bent 30° or more	More than 3 hours total per workday	 	Language added to further clarify risk factors for bent wrists. The angle for extension of the wrist was increased from 30 to 45 degrees based on the strength of the evidence. Ulnar deviation (with illustration) was added to be consistent with the risk factor for gripping.
									Illustrations were labeled for clarity.

APPENDIX C:
DIFFERENCES BETWEEN PROPOSED AND FINAL RULE

WAC 296-62-05174 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.

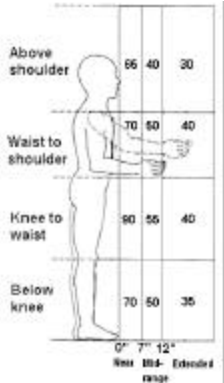
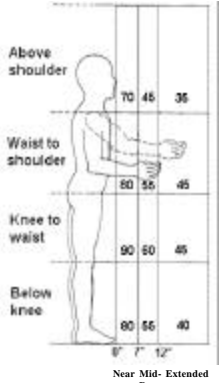
FINAL RULE					PROPOSED RULE				EXPLANATION OF CHANGES
High Hand Force					High Hand Force				The determination of grip force when using the weight of an object was clarified to be the weight of an “unsupported” object. While there is some evidence for 6 lbs. of grip force as a risk factor, the evidence is stronger at higher force levels of 9 to 10 lbs., so this risk factor was changed to gripping 10 lbs. or more. Direct grip force measurement or estimate (10 or more pounds per hand) was also added as an element of this subsection, with an example for estimating what 10 or more pounds per hand would be comparable to. Public comments noted that the proposed language was deficient in addressing actual grip forces. Language added to further clarify risk factors for bent wrists. The angle for extension of the wrist was increased from 30 to 45 degrees based on the strength of the evidence. Illustrations were labeled for clarity. An additional illustration was added to clarify ulnar deviation.
Body Part	Physical Risk Factor	Combined with	Duration	Visual Aid	Physical Risk Factor	Combined with	Duration	Visual Aid	
Arms, wrists, hands	Gripping an unsupported object(s) weighing 10 or more pounds per hand or gripping with a force of 10 pounds or more per hand. (comparable to clamping light duty automotive jumper cables onto a battery)	Highly repetitive motion	More than 3 hours total per day		Gripping an object(s) weighing more than 6 lbs. Per hand	Highly repetitive motions	More than 3 hours total per workday		
		Wrists bent in flexion 30° or more or in extension 45° or more, or in ulnar deviation 30° or more.	More than 3 hours total per day	Flexion  Extension   Ulnar Deviation 		Wrists bent 30° or more	More than 3 hours total per workday	  	

WAC 296-62-05174 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.

FINAL RULE				PROPOSED RULE			EXPLANATION OF CHANGES
Highly Repetitive Motion				Highly Repetitive Motions			
Body Part	Physical Risk Factor	Combined with	Duration	Physical Risk Factor	Combined with	Duration	
Neck, Shoulders, elbows, wrists, hands	Using the same motion with little or no variation every few seconds (excluding keying activities)	Wrists bent in flexion 30° or more or in extension 45° or more, or in ulnar deviation 30° or more. AND High, forceful exertions with the hand(s)	More than 2 hours total per day	Using the same motion with little or no variation every few seconds (excluding keying activities)	Wrists bent 30° or more AND High, forceful exertions with the hand(s)	More than 2 hours total per day	Language added to further clarify risk factors for bent wrists. The angle for extension of the wrist was increased from 30 to 45 degrees based on the strength of the evidence.
	Intensive keying	Awkward posture, including wrists bent in flexion 30° or more or in extension 45° or more, or in ulnar deviation 30° or more.	More than 4 hours total per day	Intensive keying (for example, data entry)	Awkward postures	More than 4 hours total per workday	The example given for intensive keying was dropped because a definition of intensive keying is included in the rule. “Wrist bent” language was added here for clarity and consistency with other subsections.

FINAL RULE				PROPOSED RULE			EXPLANATION OF CHANGES
Repeated Impact				Repeated Impact			
Body Part	Physical Risk Factor	Duration	Visual Aid	Physical Risk Factor	Duration	Visual Aid	
Hand	Using the hand (heel/base of palm) as a hammer more than once per minute	More than 2 hours total per day		Using the hand as a hammer more than once per minute	More than 2 hours total per workday		Language added to clarify the portion of the hand that this risk factor addresses.

WAC 296-62-05174 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.

Final Rule				Proposed Rule				Explanation of Changes		
Heavy, Frequent or Awkward Lifting				Heavy, Frequent or Awkward Lifting						
Step 2 Determine the Unadjusted Weight Limit. Where are the employee's hands when they begin to lift or lower the object? Mark that spot on the diagram below. The number in that box is the Unadjusted Weight Limit in pounds.				Step 2 Determine the Unadjusted Weight Limit. Where are the employee's hands at the beginning of the lift? Mark that spot on the diagram below. The number in that box is the Unadjusted Weight Limit in pounds.						
										
Unadjusted Weight Limit: _____ LBS.				Unadjusted Weight Limit: _____ lbs.						
Step 3 Find the Limit Reduction Modifier. Find out how many times the employee lifts per minute and the total number of hours per day spent lifting. Use this information to look up the Limit Reduction Modifier in the table below.				Step 3 Find the Percentage Modifier. Find out how many times the employee lifts per minute and the total number of hours per workday spent lifting. Use this information to look up the Percentage Modifier in the table below.						
How many lifts per minute?		For how many hours per workday?		How many lifts per minute?		For how many hours per workday?				
		1 hr or less	1 hr to 2 hrs	2 hrs or more			1 hr or less		1 hr to 2 hrs	2 hrs or more
1 lift every 5 mins		1.0	0.95	0.85	1 lift every 5 mins		100%		95%	85%
1 lift every min		0.95	0.9	0.75	1 lift every min		95%		90%	75%
2-3 lifts every min		0.9	0.85	0.65	2-3 lifts every min		90%	85%	65%	
4-5 lifts every min		0.85	0.7	0.45	4-5 lifts every min		85%	70%	45%	
6-7 lifts every min		0.75	0.5	0.25	6-7 lifts every min		75%	50%	25%	
8-9 lifts every min		0.6	0.35	0.15	8-9 lifts every min		60%	35%	15%	
10+ lifts every min		0.3	0.2	0.0	10+ lifts every min		30%	20%	0%	
Note: For lifting done less than once every five minutes, use 1.0				Note: For lifting done less than once every five minutes, use 100%						
Limit Reduction Modifier: ____.				Percentage Modifier: _____ %						

WAC 296-62-05174 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.

FINAL RULE	PROPOSED RULE	EXPLANATION OF CHANGES
<p>Heavy, Frequent or Awkward Lifting (continued)</p> <p>Step 4 Calculate the Weight Limit. Start by copying the Unadjusted Weight Limit from Step 2.</p> <p style="padding-left: 40px;">Unadjusted Weight Limit: _____ lbs.</p> <p>If the employee twists more than 45 degrees while lifting, reduce the Unadjusted Weight Limit by multiplying by 0.85. Otherwise, use the Unadjusted Weight Limit</p> <p style="padding-left: 40px;">Twisting Adjustment: X ____.</p> <p style="padding-left: 40px;">Adjusted Weight Limit: = ____ lbs.</p> <p>Multiply the Adjusted Weight Limit by the Limit Reduction Modifier from Step 3 to get the Weight Limit.</p> <p style="padding-left: 40px;">X</p> <p style="padding-left: 40px;">Limit Reduction Modifier: = ____.</p> <p style="padding-left: 40px;">Weight Limit: = ____ lbs.</p> <p>Step 5 Is this a hazard? Compare the Weight Limit calculated in Step 4 with the Actual Weight lifted from Step 1. If the Actual Weight lifted is greater than the Weight Limit calculated, then the lifting is a WMSD hazard and must be reduced to the degree technologically and economically feasible.</p>	<p>Heavy, Frequent or Awkward Lifting (continued)</p> <p>Step 4 Calculate the Weight Limit. Start by copying the Unadjusted Weight Limit from Step 2.</p> <p style="padding-left: 40px;">Unadjusted Weight Limit: _____ lbs.</p> <p>If the employee twists more than 45 degrees while lifting, subtract 10 pounds from the Unadjusted Weight Limit. Otherwise subtract 0.</p> <p style="padding-left: 40px;">Twisting Adjustment: – _____ lbs.</p> <p style="padding-left: 40px;">Adjusted Weight Limit: = _____ lbs.</p> <p>Multiply the Adjusted Weight Limit by the Percentage Modifier from Step 3 to get the Weight Limit.</p> <p style="padding-left: 40px;">X</p> <p style="padding-left: 40px;">Percentage Modifier: _____ %</p> <p style="padding-left: 40px;">Weight Limit: = _____ lbs.</p> <p>Step 5 Is this a hazard? Compare the Weight Limit calculated in Step 4 with the Actual Weight lifted from Step 1. If the Actual Weight lifted is greater than the Weight Limit calculated, then the lifting is a WMSD hazard and must be controlled.</p>	<p>The twisting adjustment was modified to more accurately reflect scientific evidence.</p> <p>Language added regarding hazard reduction to be consistent with the language used previously in the rule.</p>
<p>FINAL RULE</p> <p>Hand-Arm Vibration</p> <p>Use the instructions below to determine if a hand-arm vibration hazard exists.</p> <p>Step 4. If that point lies in the cross-hatched “Hazard” area above the upper curve, then the vibration hazard must be reduced below the hazard level or to the degree technologically and economically feasible. If the point lies between the two curves in the “Caution” area, then the job remains as a “Caution Zone Job.” If it falls in the “OK” area below the bottom curve, then no further steps are required.</p> <p>Example: An impact wrench with a vibration value of 12 m/s² is used for 2½ hours total per day. The exposure level is in the Hazard area. The vibration must be reduced below the hazard level or to the degree technologically and economically feasible.</p>	<p>PROPOSED RULE</p> <p>Vibration</p> <p>Use the instructions below to determine if a vibration hazard exists.</p> <p>Step 4. If that point lies in the cross-hatched “Hazard” area above the upper curve, then the vibration hazard must be controlled. If the point lies between the two curves in the “Caution” area, then the job remains as a “Caution Zone Job.” If it falls in the “OK” area below the bottom curve, then no further steps are required.</p> <p>Example: An impact wrench with a vibration value of 12 m/s² is used for 2½ hours total per day. The exposure level is in the Hazard area. The vibration must be controlled.</p>	<p>EXPLANATION OF CHANGES</p> <p>Language added to clearly specify that this hazard applies only to hand-arm vibration.</p> <p>Language added regarding hazard reduction to be consistent with the language used previously in the rule.</p> <p>Language added regarding hazard reduction to be consistent with the language used previously in the rule.</p>

WAC 296-62-05176 Appendix C: Standard Industry Classification (SIC) codes

FINAL RULE		
SIC*	INDUSTRY	EXAMPLES
078	Landscape and Horticultural Services	<ul style="list-style-type: none"> Lawn and Garden Services Ornamental Shrub and Tree Services
411	(removed)	
734	(removed)	
836	Residential Care	<ul style="list-style-type: none"> Establishments primarily engaged in the provision of residential social and personal care for children, the aged, and special categories of persons with some limits on ability for self-care, but where medical care is not a major element.

PROPOSED RULE		
SIC*	INDUSTRY	EXAMPLES
411	Local & Suburban Transportation	<ul style="list-style-type: none"> local and suburban transit local passenger transportation (NEC**)
734	Services to Dwellings & Other Buildings	<ul style="list-style-type: none"> disinfecting and pest control services building cleaning and maintenance services (NEC**)

EXPLANATION OF CHANGES		
Two industries were added and two industries were removed from the list of high-risk SIC codes in the implementation schedule. These changes reflect the changes in the implementation schedule. These updates were based on the most current data available on the highest risk industries for combined State Fund and Self-Insured compensable non-traumatic soft tissue disorders (1992-1998).		

Changes made throughout the proposal:

- WAC 296-62-05105 and WAC 296-62-05174 (Appendix B): The word “workday” was changed to “day” for clarity and simplicity.
- WAC 296-62-05130 and WAC 296-62-05174 (Appendix B): The phrase “technologically and economically” was added to “feasible.” Comments requested clarification of the term “feasible”. Adding the phrase “technologically and economically” clarifies and limits the meaning in accordance with agency intent.

Minor editorial changes in the proposal:

- WAC 296-62-05105: In subsection “Highly Repetitive Motion,” the word “except” was changed to “excluding” for clarity and simplicity.
- WAC 296-62-05130: The phrase “as described below” was added for clarity and simplicity and in subsection 6, “job or task” was changed to “work activities.”
- WAC 296-62-05130: “recovery cycles” was changed to “recovery time” for clarity.
- WAC 296-62-05150: “Job Strain Index” – citation language abbreviations were spelled out (i.e. “Vol.” to “volume”) for clarity.
 - “UAW-GM” – Acronym spelled out for clarity.
 - “Work-Related Musculoskeletal Disorders (WMSDs)” the word “Occupational” was changed to “Work-related” for clarity.
 - “Recovery Cycles” was changed to “Recovery Time” for clarity.
- WAC 296-62-05174 Appendix B: Awkward Posture – Shoulders: “Holding” was replaced with “Working with”

Formatting changes:

- WAC 296-62-05105: Reformatted the table to make it easier to use. The bullets have been replaced with numbers, which are easier to reference and which better indicate the analysis of “caution zone jobs” is complete if the work activities reviewed do not contain any of the specific risk factors identified in numbers 1-14..
- WAC 296-62-05122, WAC 296-62-05130 and WAC 296-62-05140: Subsection numbers or letters were changed to bullets.
- Throughout the rule, subsection numbers that were formatted with a period were re-formatted in parentheses.